



## Air Resources Management

### Introduction

In 1970, Congress passed the Clean Air Act (CAA), establishing national policy toward preserving, protecting, and enhancing air quality. In 1977, Congress amended the CAA, designating all national parks, established as of August 7, 1977, that exceeded 6,000 acres in size, and wilderness areas over 5,000 acres, as mandatory Class I areas. These Class I areas, set aside for their pristine air quality or other natural, scenic, recreational, or historic values, are afforded the greatest degree of air quality protection under the CAA. Shenandoah is one of these Class I areas.

The 1977 CAA amendments also specifically require visibility protection for mandatory Federal Class I areas. Section 169A of the CAA sets a national goal of preventing any future and remedying any existing human-caused visibility impairment in Class I areas. The 1990 CAA amendments provided additional tools to accomplish the protection including visibility transport commissions and acid rain reduction provisions. In 1999, the Environmental Protection Agency (EPA) promulgated visibility protection regulations that require states to put in place cost-effective emissions reductions with the goal of returning to natural visibility conditions in 60 years.



Hybrid car being used by park employee.

Examples of this harm include vegetative discoloration and growth disruption from ozone, loss of aquatic species from stream acidification, shifts in nutrient availability from acid deposition, and erosion of building surfaces and rock formations. Air pollution impairs visibility and contributes to climate change. Air pollution can also be detrimental to human health.

Sources of air pollution that affect Shenandoah National Park are largely outside of the park. These include industrial facilities located throughout the mid-Atlantic region and the Ohio River Valley as well as urban centers in this same region. Because most areas adjacent to the park are rural and agricultural, it is clear that transport of pollutants from distant locations is an important element upon which park air quality hinges. Even some agricultural activities, such as ammonia from chicken houses and pesticides that are applied to adjacent fields, may contribute to air pollution in the park. In-park emission sources are limited, but do include motor vehicles, maintenance equipment, small boilers and diesel generators. The relative contribution from the in-park sources is very small compared to other sources. In a July 2002 report describing an emissions inventory for Shenandoah National Park, it was determined that less than 1% of emissions were produced from in-park sources.



Shenandoah Assessment Cover

### Management Needs

The air is an important component of the natural system of a park in its own right. The presence of pollution in the atmosphere results directly in air quality degradation. Air pollution is also a critical factor affecting the quality of other environmental resources as well as the human-made structures and facilities in the area. Polluted air can harm park resources in a variety of ways depending upon the chemistry of the pollutant, weather and environmental conditions, and the nature or sensitivity of park resources.

### Current Program Directions

Air quality concerns at Shenandoah have focused on three principle areas: acid deposition, visibility, and gaseous pollutants, primarily ozone. More recent attention has been given to mercury deposition.

Management of air resources at Shenandoah is complex and often highly technical. Programs are most readily understood if they are grouped logically into inventory, monitoring, mitigation, research, and education categories.



## Air Resources Management (continued...)

Each of these is briefly described below:

**Air resources inventory** – This program category includes all activities aimed at describing current air quality conditions in the park as well as air quality related values that need to be protected. This information has been well established for Shenandoah.

**Air quality monitoring** – This category includes all activities that document, over time, the presence of air pollutants in the park, their effects, and the associated meteorological conditions. A separate Fact Sheet has been prepared describing Shenandoah's Air Quality Monitoring programs.

**Air resources protection and mitigation** – This is perhaps the most complex of the categories in that it embraces many disparate activities. Included here are things like emission application and permit reviews, analysis of modeling results, tracking activities of and engagement with Regional Planning Organizations and individual states as they develop plans and regulations, formulation of proposals to be considered in settlement proceedings, tracking air quality legislation, and tracking EPA enforcement or implementation of their air programs. Park staff members also track ozone conditions and issue Ozone Advisories in accordance with standard procedures developed for Shenandoah.

**Air quality research** – Shenandoah has a long history of supporting research related to air quality. Most studies have examined the effects of air pollutants on park resources such as the effect of ozone on forest resources or the effects of acid deposition on stream chemistry and aquatic fauna. Mercury deposition is emerging as an area that will need future investigation.

**Air quality education** – Although the National Park Service has the authority to work to protect air quality in Class I areas, the nature of the sources of emissions and the complexity of the movement of those emissions limits the ability of the agency to make changes for the better. It is therefore imperative that the agency engage in public education efforts to improve understanding about why air pollution is a problem in parks and about what the public can do to make changes.

### Accomplishments

Highlights of recent accomplishments and events include the completion of the park's emissions inventory in 2002 and the air resources assessment in 2003. In 2004, a portion of the park was designated by the state of Virginia and EPA as a non-attainment area for ozone. Most of the ozone that caused elevated levels and in-turn the non-attainment

designation was from sources that are long distances from the park. Surprisingly, it was not necessary to issue any ozone advisories in 2004. During 2004, one finding of adverse impact was declared by the Assistant Secretary of the Interior for a proposed power plant (Longview) in West Virginia. Terms of the permit for that plant were subsequently re-negotiated and the finding was withdrawn. In addition, an application and proposed permit for a natural gas power plant, proposed near Front Royal, Virginia (Competitive Power Ventures – Warren County) were reviewed. This facility is very close to the park but no adverse impact finding was issued. In compliance with a Consent Decree, the park completed a Mitigation Plan in concert with Virginia Electric Power Company (VEPCO). In 2004, in accordance with that decree, VEPCO deposited \$1,000,000 in a restoration account. Park staff is using those funds to reduce emissions from mobile sources. Late in 2004, the natural resources staff launched the Clean Air Restoration Effort (CARE) aimed at making park operational changes that will reduce air pollution. This effort is being directed by a recently formed inter-divisional working group.

Up until the fall of 2003, the park was heavily involved in VISTAS, a regional planning organization, made up of state and federal representatives from throughout the southeastern states, that is dealing with the regional haze issue. In the fall of 2003, the park's Air Resources Specialist transferred. Due to budget constraints, we have been unable to refill this position. Since that time, the park has not had any involvement in VISTAS, reviews of source applications and permits has become much less intense, coordination with Forest Service air resources specialists and state officials has dropped off, and many details related to the park's air resources program are not being attended to. The Air Resources Specialist position is critical to the protection of park resources.

### References

- Anon. 2002. Air Emissions Inventory for Shenandoah National Park. Air Resources Division, National Park Service. Denver, Colorado.
- Sullivan, T.J., et al. 2003. Assessment of air quality and related values in Shenandoah National Park. Technical Report NPS/NERCHAL/NRTR-03/090. Natural Resource Stewardship and Science, Northeast Region, National Park Service, Philadelphia, Pennsylvania.